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71 Applicant: Smith, Lloyd T.
715 West Broadway
Newton Kansas 67114(US)

72 Inventor: Smith, Lloyd T.
715 West Broadway
Newton Kansas 67114(US)

72 Inventor: Berry, Loren E.
1401 Westborough
Newton Kansas 67114(US)

72 Inventor: Ediger, Glen W.
127 South Main
Newton Kansas 67114(US)

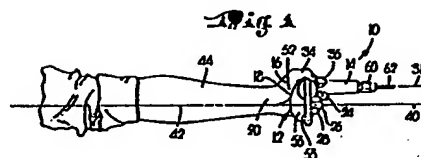
72 Inventor: Hindman, Thomas E.
127 N. Bleckley
Wichita Kansas 67208(US)

72 Inventor: Ten Eyck, Richard E.
7456 South Seneca
Wichita Kansas 67208(US)

74 Representative: UEXKÜLL & STOLBERG Patentanwälte
Beselerstrasse 4
D-2000 Hamburg 52(DE)

64 Hand grip for hand tools.

67 A hand grip for hand tools has a generally bulbar configuration conforming to the shape of the palm of the hand when clenched in grasping relation to the hand grip. A shank extending from the hand grip adjacent its normally uppermost end has opposed grooves for receiving two fingers which grip the shank. The longitudinal axis of the shank is parallel with an extension of the axis of rotation of the forearm and the wrist while the latter is straight and unbent.



HAND GRIP FOR HAND TOOLS

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It has been recognized that a multiplicity of diseases, attributable to improperly designed hand tools, may soon reach epidemic proportions. The motions of the hand, wrist and forearm during use of such tools are irregular and oftentimes somewhat intense, causing permanent injury in many instances. The problem becomes acute when the tools are used continuously over long periods of time, requiring all too frequently the need for rest or physical therapy and even remedial surgery, with resultant loss of workmen time if not substantial incapacity.

Certain of the solutions heretofore suggested include bent shanks, curved or bent handles, handles wrapped with soft plastics, yieldable grip portions, designs intended to prevent or reduce wrist bending and configurations which permit the shanks to straddle the thumb and forefinger. But no such suggestion has completely or satisfactorily solved the problem.

Keeping in mind, therefore, the insufficiencies and other limitations of the hand, its fingers, the wrist and the forearm, as well as the nature of the tasks to be performed, we have provided a hand grip for use with a wide variety of tools which has, as an important attribute, the avoidance of stress concentrations effected primarily by equal distribution of the compression forces throughout the entire surface area of the palm of the hand.

As distinguished from pistol grip and spherical configurations which undesirably fre-

1 quent the marketplace, and distinguishable from a
 mere elongated, relatively small diameter grip
 portion, we employ a smooth, bulbar configuration
 which fills and conforms to the shape of the palm.
5 The accompanying shank is disposed to be straddled
 between and gripped by the forefinger and the next
 adjacent middle finger, and the axis of the shank
 is properly related to the axis of rotation of the
10 forearm and unbent wrist.

10 The hand grip portion is of such nature
 as to permit, if desired, top engagement by the
 ball of the thumb and a partial wrap-around below
 the shank by three fingers to force the hand grip
15 portion into a tight, non-slip snug fit into the
 palm. The user is, therefore, able to maintain
 complete control not only in regard to imparted
 thrust but to impede rotation of the shank about
 its longitudinal axis. Thus, inasmuch as the
20 wrist is kept straight and all motion patterns
 have been taken into consideration, the likelihood
 of injuries has been reduced if not entirely
 eliminated.

 In the drawings:

25 Figure 1 is a side elevational view of a
 hand grip for hand tools made in accordance with
 our present invention showing the same in associa-
 tion with a user's arm and grasped by the hand;

30 Fig. 2 is an enlarged view showing in
 elevation the side thereof depicted in Fig. 1;

 Fig. 3 is an elevational view showing
 the rear end thereof;

 Fig. 4 is an elevational view showing
 the front end thereof;

35 Fig. 5 is a top plan view thereof;

1 Fig. 6 is a rear elevational view there-
of; and

 Fig. 7 is a view showing the bottom of
the hand grip.

5 The grip 12 is shaped and sized to
substantially fill, snugly fit and smoothly engage
the palm of the hand 16 as shown in Fig. 1. The
grip 12 essentially conforms to the concave,
10 cupped configuration of the hand 14 when clenched
as illustrated.

 To these ends, the grip 12, when so
grasped, has a normally rearmost, elongated,
longitudinally and transversely convex edge 18
15 adapted to receive a straight thrust imparted
thereto by the hand 16 adjacent the wrist 20. The
grip 12 is also provided, when grasped by the hand
16, a normally forwardmost, elongated, longitudi-
nally and transversely convex edge 22. In use,
20 the edge 22 is wrapped by the middle fingers 24
and 26 and the little finger 28 of the hand 16.

 Additionally, the grip 12, once again,
when grasped by the hand 16, is provided with a
normally lowermost, elongated, longitudinally and
25 transversely convex free end 30 adjacent the
finger 28. Further, there is provided an
elongated, longitudinally and transversely convex
end 32 which is normally uppermost when grasped by
the hand 16. The end 32 is disposed for
30 engagement, when so desired, by the ball of the
thumb 34 of the hand 16.

 The shank 14, at the end 32, extends
forwardly from the edge 22 and is disposed for a
straddling grasp at the grip 12 between the fore-
35 finger 36 and the finger 24 of the hand 16 for

1 impeding rotation of the shank 14 about its longi-
tudinal axis 38. Noteworthy is the fact that the
axis 38 is disposed in parallelism with an exten-
sion 40 of the axis 42 of rotation of the forearm
44 and of the straight, unbent wrist 20 when the
5 grip 12 is grasped.

The shank 14 has a transverse, top
groove 46 adjacent the grip 12 for receiving the
finger 36 and a transverse, bottom groove 48
4 adjacent the grip 12 for receiving the finger 24.
10 The concave grooves 46 and 48 are, in effect,
portions of the end 32 and edge 22 respectively
and are smoothly uninterrupted as they cooperate
to essentially merge together as a substantial
wrap around of the shank 14. The groove 46 opens
15 upwardly whereas the groove 48 opens downwardly
and forwardly, defined by a rounded, lowermost
terminus 50 disposed transversely of the edge 22.

Accordingly, the edges 18 and 22 and the
ends 30 and 32 present a smooth, continuous, unin-
20 interrupted arch extending from the groove 46 to the
terminus 50 of the groove 48 such that the edge 18
fits snugly at the end 32 against the base 52 of
the palm of the hand 16 adjacent the thumb 34.
Thus, the compressive forces of the hand 16 on the
25 grip 12 are evenly distributed throughout the
surface area of the palm when the grip 12 is
grasped whereby to obtain both maximum leverage
and control.

To this end also, the grip 12 has a pair
30 of sides 54 and 56 which are convex longitudinally
(between ends 30 and 32) and transversely (between
edges 18 and 22) with the width of the grip 12
(between sides 54 and 56) progressively increasing
as the edge 18 is approached. The sides 54 and 56
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1 merge in a roundish smoothness with the ends 30
and 32, the edges 18 and 22 and the notches 46 and
48, and fade continuously and evenly into the
shank 14.

5 Forming no part of the present invention
is a crank 58 on the side 56 which, when manually
turned, rotates a chuck 60 (on the shank 14) and a
drill bit 62 carried by the chuck 60 through
10 mechanism (not shown) in the grip 12 and the shank
14; bit storage grooves 64 in the shank 14 are
releasably held in place by a C-band 66 rotatable
on the shank 14.

15 In use, as demonstrated in Fig. 1, the
nature of the grip 12, as shown and above de-
scribed, somewhat automatically causes the opera-
tor to grasp the tool 10 and place it in use
without bending the wrist 20 such that counter-
rotative forces imparted by the bit 62 to the
shank 14 and the grip 12 are easily resisted.
20 Quite naturally also is the thrust to be imparted
to the bit 62 from the base 52 of the palm of the
hand 16, all without tiredness or likelihood of
injury to the hand 16, wrist 20 or forearm 44 even
after long, continuous periods of use day after
day.

25 There is virtually no risk of the grip
18 slipping from within or turning in the palm of
the hand 16, eliminating skin blisters and cal-
luses, muscular soreness and other conditions
30 characterized by inflammation or pain in bones,
ligaments, joints and fibrous tissue. All such
safety measures result from perfection in the fit
of the grip 12 within the hand 16 and the natural-
ness of the user keeping his wrist 20 unbent and
35 maintaining the axis 38 parallel with the exten-

1 sion 40 of the axis 42.

5 The grip 12 and its shank 14 are adapted, with the same features and advantages, for many uses other than as a part of a drill. In those cases, especially when the crank 58 is omitted, the user might desire to place the ball of his thumb 34 in engagement with the side 56 adjacent the end 32. By way of example only, with
10 or without the chuck 60 or its equivalent, attachments to the shank 14 include such hand tools as brooms, cutters, sanders, planes, push drills, scrapers, screwdrivers and wrenches. In each instance, torque and/or thrust can be easily controlled by the operator.

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1 Claims.

1 1. In a hand tool,
 an elongated, generally bulbar, hand grip
 portion shaped and sized to substan-
5 tially fill, snugly fit and smoothly
 engage the palm of the hand and essen-
 tially conform to the concave, cupped
 configuration of the clenched hand,
 whereby the compressive forces of the
10 hand on the grip portion are evenly
 distributed throughout the surface area
 of the palm when said portion is grasped
 to obtain both maximum leverage and
 control.

15 2. The invention of Claim 1, said
 portion having, when grasped by the hand, a nor-
 mally rearmost, elongated, longitudinally and
 transversely convex edge adapted to receive a
20 straight thrust imparted thereto by the hand
 adjacent the wrist.

25 3. The invention of Claim 1, said
 portion having, when grasped by the hand, a nor-
 mally forwardmost, elongated, longitudinally and
 transversely convex edge wrapped by the middle and
 little fingers of the hand.

30 4. The invention of Claim 1, said
 portion having, when grasped by the hand, a nor-
 mally lowermost, elongated, longitudinally and
 transversely convex free end adjacent the little
 finger of the hand.

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1 5. The invention of Claim 1, said
portion having, when grasped by the hand, a nor-
mally uppermost, elongated, longitudinally and
transversely convex end disposed for engagement,
5 when so desired, by the ball of the thumb of the
hand.

10 6. The invention of Claim 5, said
portion having, when grasped by the hand, a nor-
mally forwardmost, elongated, longitudinally and
transversely convex edge looped by the middle and
little fingers of the hand for maintaining the
grip portion tightly engaged in said palm.

15 7. The invention of Claim 6, said grip
portion having, when grasped by the hand, an
elongated shank portion at said uppermost end
extending forwardly from said forwardmost edge and
disposed for a straddling grasp at said grip por-
20 tion between the forefinger and next adjacent
middle finger of the hand for impeding rotation of
the shank portion about its longitudinal axis.

25 8. The invention of Claim 7, said axis
of the shank portion being disposed in parallelism
with an extension of the axis of rotation of the
forearm and straight, unbent wrist when the grip
portion is grasped.

30 9. The invention of Claim 7, said
shank having a transverse, top groove adjacent the
grip portion for receiving said forefinger.

1 10. The invention of Claim 7, said
shank having a transverse, bottom groove adjacent
the grip portion for receiving said next adjacent
middle finger.

5 11. The invention of Claim 10, said
shank having a transverse, top groove adjacent the
grip portion for receiving said forefinger.

10 12. The invention of Claim 11, said
portion having, when grasped by the hand, a nor-
mally rearmost, elongated, longitudinally and
transversely convex edge adapted to receive a
straight thrust imparted thereto by the hand
adjacent the wrist.

15 13. The invention of Claim 12, said
portion having, when grasped by the hand, a nor-
mally forwardmost, elongated, longitudinally and
transversely convex edge wrapped by the middle and
20 little fingers of the hand.

25 14. The invention of Claim 13, said
portion having, when grasped by the hand, a nor-
mally lowermost, elongated, longitudinally and
transversely convex free end adjacent the little
finger of the hand.

30 15. The invention of Claim 14, said
edges and said ends presenting a continuous,
uninterrupted arch extending from said top groove
to said bottom groove.

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Fig. 1

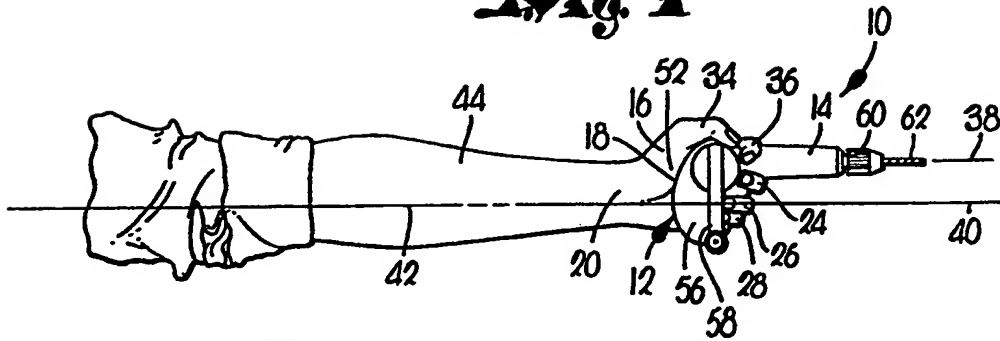


Fig. 2

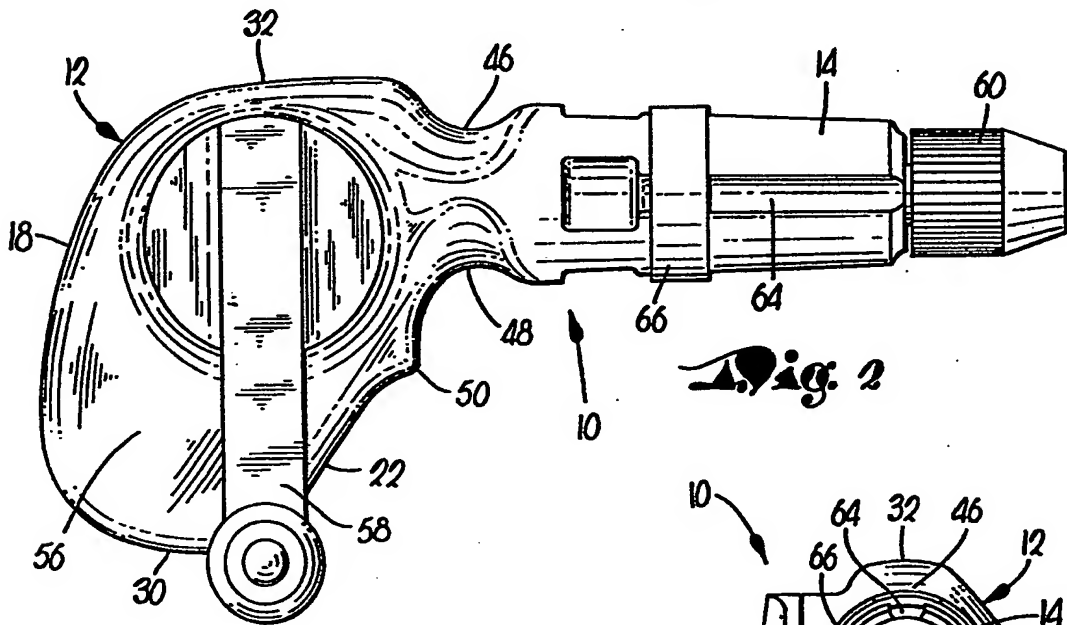


Fig. 3

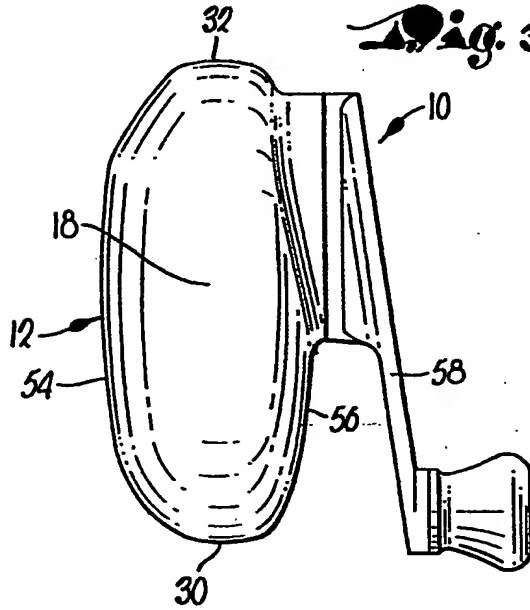


Fig. 4

